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Colloquium of the Physics Department of ENS

Mercredi 15 Novembre 2023, 13 :30
DPT-PHYS-ENS, ConfIV (E244) - Dépt de Physique de l'ENS - 24 rue Lhomond 75005 PARIS
Domaines : physics

Titre : *Cell biophysics : phase diagrams, phase portraits and trajectories*

Orateur : **Cecile Sykes (CNRS - LPENS)**

Résumé : *Cell functions such as motility and division can be studied with the use of stripped-down experimental systems by choosing carefully a limited number of purified proteins that reproduce cellular behaviours in simplified and controlled conditions. As an example, cytoskeleton dynamics are reproduced on liposome membranes (Figure 1) and soft matter variables, such as membrane tension and the structural details of the cytoskeleton architecture are tuned. Movements and deformations can be described by physical models allowing to draw phase diagrams. I will present a few examples including inward and outward membrane deformations generated by actin dynamicsi, and buckling/wrinkling of liposomes under osmotic deflationii. How the cytoskeleton interacts with the nucleus during cell motility still needs to be addressed. This is the motivation of my new project at LPENS, based on our recent study that the nucleus-cytoskeleton link accumulates at the front of the nucleus when cells move through narrow constrictionsiii. I will present our current analysis of nucleus translocation during confined cell motility : we use an inference method derived from a Langevin equation approach applied to nuclei trajectories and shape changes.*